

Claims

- 10 1. A process for continuously drying protein-containing sludge, in particular sewage sludge, in a fluidised bed (20) through which a drying gas flows, wherein partially de-watered sludge (6) is added to the fluidised bed (20) in granulate form (21) and dried sludge (10) is removed therefrom, characterised in that
- 15 the granules are formed without the addition of dried substances and the granulating process is preferably combined with pressing.
- 20 2. The process according to claim 1, characterised in that the granular material (21) or a preliminary product thereof is applied onto the fluidised bed (20) immediately following its production and by gravity.
- 25 3. The process according to claim 1, characterised in that the granular material (21) or a preliminary product thereof is introduced directly into the fluidised bed (20) below the surface (20a) thereof.
- 30 4. The process according to any one of claims 1 to 3, characterised in that the applied granules (21) are used while having an average diameter in the range of 1 to 10 mm, preferably 3 to 7 mm, in particular about 5 mm.
- 35 5. The process according to any one of claims 1 to 4, characterised in that the partially de-watered

sludge (6) is dried to have a dry substances content of at least 90% of the mass of the dried product.

- 5 6. The process according to any one of claims 1 to 5, characterised in that superheated water vapor is used as a drying gas.
- 10 7. The process according to any one of claims 1 to 6, characterised in that process start-up is carried out by using a fluidised bed (20) of already dried sludge (10) in granulate form.
- 15 8. The process according to any one of claims 1 to 7, characterised in that the fluidised bed (20) is heated by means of a heat exchanger (16).
- 20 9. The process according to claim 8, characterised in that saturated steam having a pressure above atmospheric of preferably 5 to 25 bar is used as a heating medium for the heat exchanger (16).
- 25 10. The process according to any one of claims 1 to 9, characterised in that drying is performed at a pressure slightly above atmospheric pressure.
- 30 11. The process according to any one of claims 1 to 9, characterised in that drying is performed at a pressure slightly below atmospheric pressure.
12. The process according to any one of claims 1 to 11, characterised in that the exhaust vapor expelled from the dried sludge (10) is compressed and condensed under the pressure elevated as a result

of compression, preferably in the heat exchanger (16) accommodated in the fluidised bed (20).

- 5 **13.** A device for continuously drying protein-containing
sludge, in particular sewage sludge, in a fluidised
bed (20), comprising
- 10 a drying container (13) which includes a lower
receiving chamber (18) for drying gas and a gas-
permeable support (19) for the fluidised bed (20),
- 15 means (14) for feeding the partially de-watered
sludge (6)
- 20 and means (17) for withdrawing the dried sludge
(10),
- said feeding means (14) including granulating means
(14a),
- 25 characterised in that
- said feeding means (14) do not include means for
admixing dried substances.
- 30 **14.** The device according to claim 13, characterised in
that the outlet range (22) of the granulating means
(14a) is positioned adjacent to, or inside, the
peripheral wall of the drying container (13) and
above the means (19) supporting the fluidised bed
(20).
- 35 **15.** The device according to claim 14, characterised in
that the outlet range (22) of the granulating means
(14a) is positioned above the surface of the
fluidised bed (20a).

16. The device according to claim 14, characterised in that the outlet range (22) of the granulating means (14a) is positioned below the surface (20a) of the fluidised bed.
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17. The device according to any one of claims 13 to 16, characterised in that the granulating means (14a) are adapted to form a preliminary product of the granular material (21), e.g. having the form of
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- notched rods.
18. The device according to any one of claims 13 to 17, characterised in that the granulating means (14a) subject the granules to pressing forces during the granulating process.
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19. The device according to any one of claims 13 to 18, characterised in that the applied granules (21) present average diameters in the range of 1 to
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- 10 mm, preferably 3 to 7 mm, in particular about 5 mm.
20. The device according to any one of claims 13 to 19, characterised in that at least one heat exchanger (16) is present in the fluidised bed (20) and includes heat exchanger surfaces onto which the material of the fluidised bed (20) may be applied.
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21. The device according to any one of claims 13 to 20, characterised in that the drying container (13) is adapted to be pressure-tight.
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22. The device according to any one of claims 13 to 21, characterised by means containing a compressor and

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